Lecture 8

Valuation Models for Stock Prices

- **NOTE: Important to examine the 'Description of the Presentations model' for directions on the class presentations**

- Cash Flow Models of Equity Valuation.
- Financial Statement Analysis
- Determining the Value Drivers
- Cases in Fundamental Analysis

- Reading: SAIS, sec. 8.1, 8.2 and 8.3 and *Case Downloads from the Class Webpage (see last slides in this lecture)*

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Connection to Final Exam Question

ii) "The search for the 'correct' way to value common stocks, or even one that works, has occupied a huge amount of effort over a long period of time....the implementation of a system to selectively value or select common stocks is a difficult task. This is a task that a valuation model purports to accomplish."
Describe the **discounted dividend** cash flow valuation models conventionally used to analyse common stocks. How do these models differ from valuation models that discount cash flows other than dividends? What are some important limitations of using accounting data to implement discounted cash flow valuation?

It is commonplace to hear that discounted cash flow (DCF) models are the appropriate way to value common stocks – in the context of value investing, DCF has been proposed as the way to estimate 'intrinsic value'. This lecture covers these models and the connection to using accounting data for stock valuation.

It is doubtful that such models can do any more than provide some structure to a stock valuation. As the quote recognizes, stock valuation is 'a difficult task' – too difficult in many cases.

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History of Discounted Cash Flow (*DCF*) Models

- Origins of *DCF* models found in John Burr Williams The Theory of Investment Value (1938).
  - The present value for a business or a security, such as a stock or bond, can be determined by discounting the future stream of expected cash inflows minus expected cash outflows at the appropriate rate of interest.

- This basic *DCF* model was adapted and expanded in Gordon (1962)
  - valuation of companies in regulated industries was a central concern.
  - the constant growth version of the discounted dividend model is often referred to as the 'Gordon growth model'

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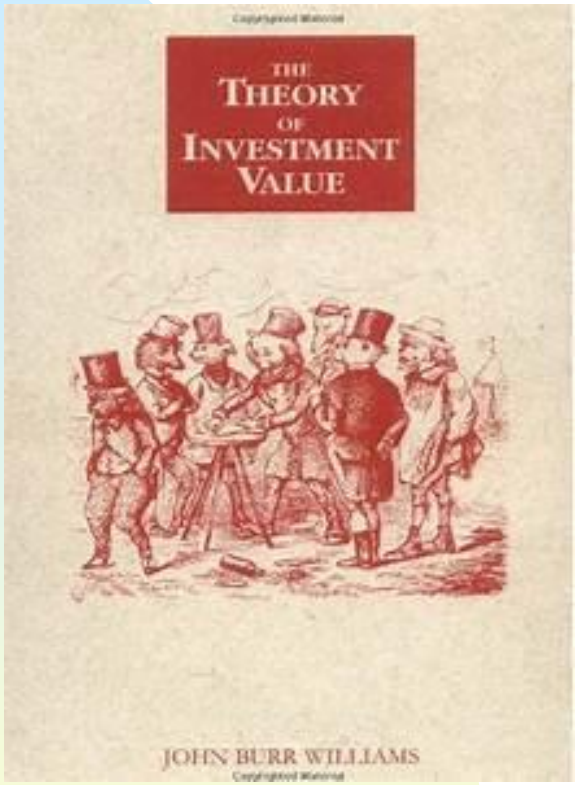
Who was John Burr Williams (1900-1989)?



- Williams is credited with being an early proponent of using discounted cash flow to estimate the '**intrinsic value**' of a stock.
- This represented a more theoretical and mathematical approach to 'intrinsic value' than the relatively heuristic notions previously available.
- Williams was a long time student at Harvard and the Theory of Investment Value was his Harvard PhD thesis in Economics
- Williams worked as a security analysis and sometime professor.

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J.B. Williams DCF model was not new. Previous writers such as Macaulay (1938) questioned the application of *DCF* to value common stocks

The 'assumption of payment', which must be made before the promised or 'hypothetical' yield of a bond can be calculated ... may, as we have seen, be a mere mathematical fiction for all except the highest grade of bonds. But, for common stocks it is not only a mathematical fiction but also an **economic absurdity**. Even if the chance that the promises contained in a bond will be kept is negligibly small that the promises are little more than mere words, they are at least *definite* words and, as such, can stand the strain of mathematical manipulation.

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Macaulay (1938) The Movement of Interest Rates, Bonds, Yields and Stock Prices in the United States since 1865 was a monumental NBER study. On $k = g$ in the Gordon DCF model, Macaulay observed:

- If such an assumption were made as that the dividend payments were to increase in geometric progression, the future that could be neglected would be still more distant. **One of the strangest rationalizations** of unending price rise that appeared in the months immediately preceding the stock market culmination of 1929 was evolved by a Wall Street economist. He presented to the directors of the investment trust with which he was associated statistical evidence that the wealth of the country increased in the long run about 3 per cent per annum. He then argued that corporations as a class should be expected to share in this growth at this rate and hence that their **dividends should be expected, over the long run, to increase at least 3 per cent per annum**; that is to say in such a series as \$4.12, \$4.24, \$4.37, etc., or $\$4(1.03)$, $\$4(1.03)^2$, $\$4(1.03)^3$, etc. He then suggested that, with increasing financial stabilization in the country, **these future dividends would eventually be discounted at a rate that would not exceed 3 per cent per annum**. But, he continued, if distant enough payments were assumed, **discounting them at this rate would give very high prices for the stocks**. The suggestion was even made that, as there seemed to be no necessary time limit to the 3 per cent rate of growth in wealth, there should logically be no 'ceiling' whatever for stock prices. **The phantasy was strangely reminiscent of the Petersburg Paradox in the mathematical theory of probability.**

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Narrow vs. Broad Dividends

- Initial conception of the dividend *DCF* models were developed for high cash payout securities
  - Gordon focused on US utility stocks where the cash payout was determined by state/federal rate setting bodies that set utility rates for private companies
- More recently, share buyback programs have been replacing high cash payout
  - *narrow dividends* are just cash dividend payout while *broad dividends* include both buybacks and cash dividends
- See three files in 417_lecture8.zip on growth of share repurchases

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Narrow and Broad Dividends for Pfizer (from 10-K)

Consolidated Statements of Cash Flows
Pfizer Inc. and Subsidiary Companies

(MILLIONS)	Year Ended December 31, 2017	2016	2015
Operating Activities			
Net income before allocation to noncontrolling interests	$ 21,355	$ 7,246	$ 6,986
Net cash provided by operating activities	16,470	15,901	14,688
Financing Activities			
Proceeds from short-term borrowings	8,464	7,472	5,557
Principal payments on short-term borrowings	(9,990)	(5,102)	(3,965)
Net proceeds from/(payments on) short-term borrowings with original maturities of three months or less	1,401	(3,084)	2,717
Proceeds from issuance of long-term debt	5,274	10,976	—
Principal payments on long-term debt	(6,154)	(7,689)	(2,990)
Purchases of common stock	(5,000)	(5,000)	(6,160)
Cash dividends paid	(7,659)	(7,317)	(6,940)
Proceeds from exercise of stock options	862	1,019	1,263
Other financing activities, net	(233)	(196)	109
Net cash used in financing activities	(13,035)	(8,921)	(10,409)

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Figure 4.1.c Prices, Narrow and Broad Dividends

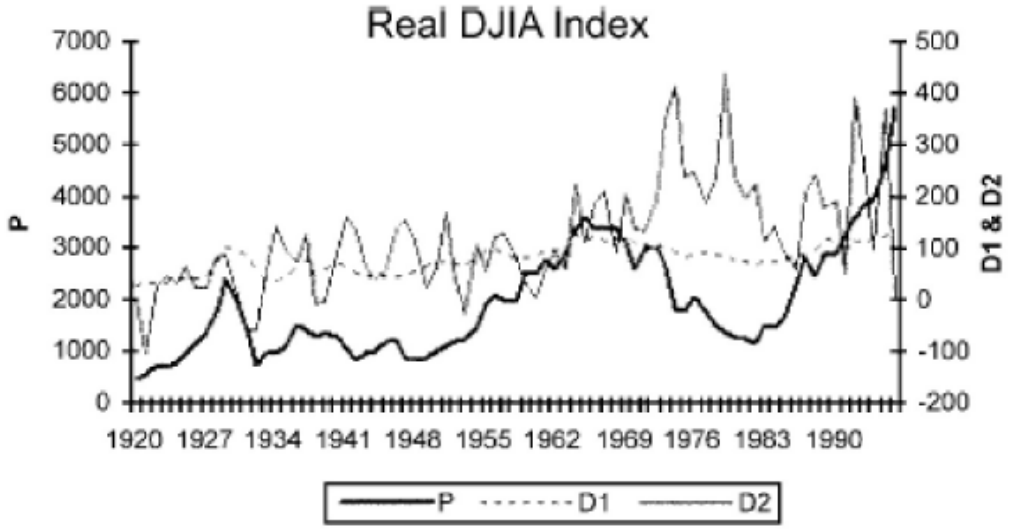

FIG. 1.—Price, narrow dividend (D1), and broad dividend (D2) series for real DJIA index and real S&P industrial index, respectively.

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Figure 4.2.a US Dividend Payers, 1926-1999

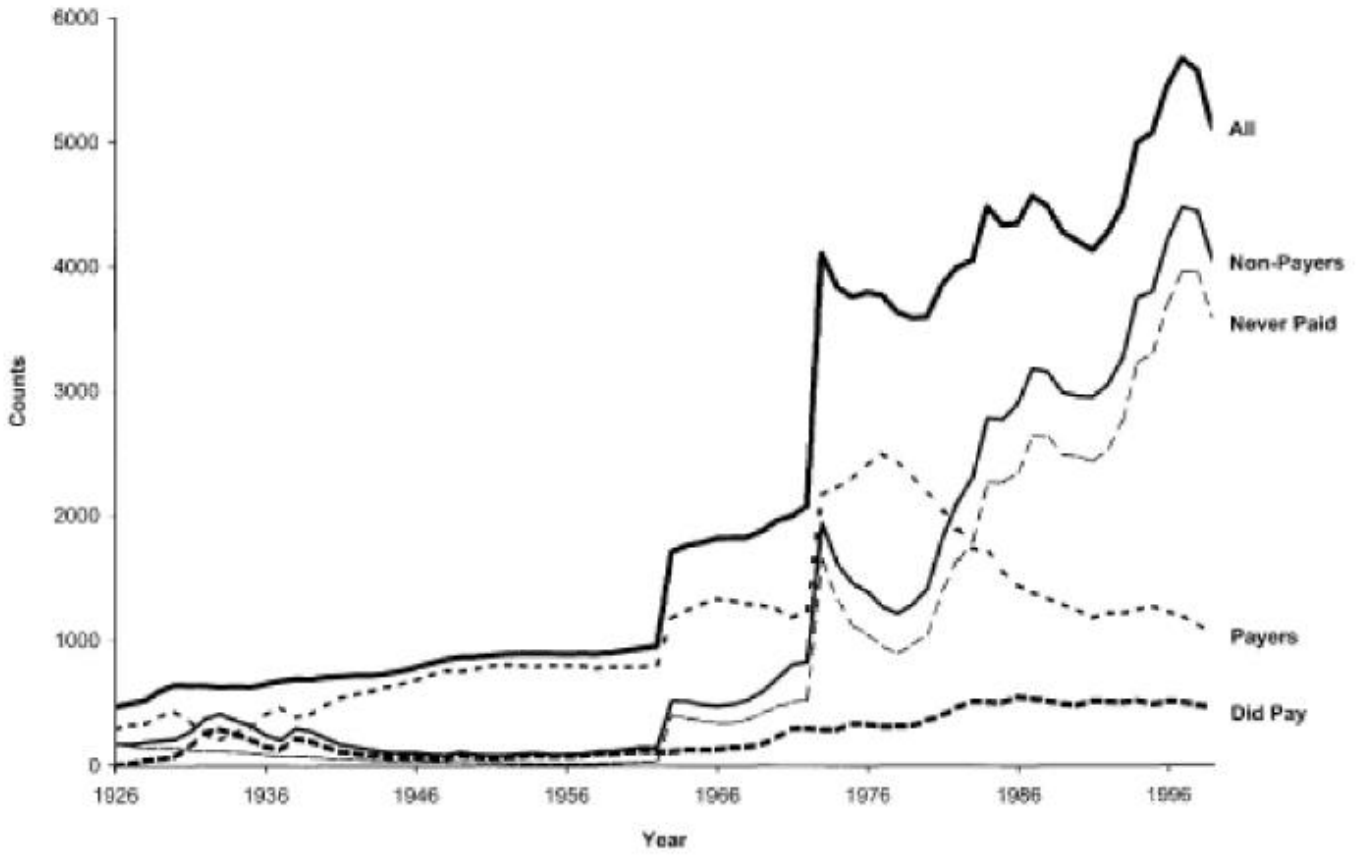

Fig. 1. The number of CRSP firms in different dividend groups. The CRSP sample includes NYSE, AMEX, and NASDAQ securities with share codes of 10 or 11. A firm must have market equity data (price and shares outstanding) for December of year t to be in the sample for that year. We exclude utilities (SIC codes 4900–4949) and financial firms (SIC codes 6000–6999). Payers pay dividends in year t; non-payers do not. The two subgroups of non-payers are firms that have never paid and former payers (firms that do not pay in year t but did pay in a previous year).

Title: Dividend payers and non-payers, 33 countries and 17,106 listed firms, 1985-2006

Summary Statistics: Annual number of dividend payers and non-payers, never payers and former payers, means and medians of payout ratios, numbers (and percentages) of payers and non-payers: 1985–2006 for all countries. Payers pay dividends in year t; non-payers do not. The two subgroups of non-payers are firms that have never paid and former payers (firms that do not pay in year t but did in a previous year).

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
All firms	1434	1623	2059	2433	2697	3052	3556	3855	4105	4823	5519	6459	6997	8047	9128	10837	12407	13388	13895	14928	15714	17106
Mean of dividend payout ratio of payers	38%	38%	37%	33%	34%	35%	37%	38%	38%	36%	35%	35%	34%	35%	34%	33%	35%	37%	36%	34%	34%	34%
Median of dividend payout ratio of payers	34%	34%	33%	30%	30%	31%	32%	34%	34%	31%	31%	30%	29%	30%	29%	28%	30%	32%	31%	29%	29%	29%
Payers	1246	1393	1707	2020	2236	2529	2883	3048	3157	3418	3867	4425	4642	4951	5282	5882	6427	6843	7208	7809	8367	9121
	87%	86%	83%	83%	83%	83%	81%	79%	77%	71%	70%	69%	66%	62%	58%	54%	52%	51%	52%	52%	53%	53%
Non-payers	188	230	352	413	461	523	673	807	948	1405	1652	2034	2355	3096	3846	4955	5980	6545	6687	7119	7347	7985
	13%	14%	17%	17%	17%	17%	19%	21%	23%	29%	30%	32%	34%	39%	42%	46%	48%	49%	48%	48%	47%	47%
Never payers	0	169	202	284	343	387	444	571	674	805	1201	1469	1773	2061	2635	3246	4200	5106	5453	5662	5907	6201
	0%	10%	10%	12%	13%	13%	13%	15%	16%	17%	22%	23%	25%	26%	29%	30%	34%	38%	39%	38%	38%	36%
Former payers	0	14	25	21	28	49	76	100	122	142	108	150	203	329	354	392	468	617	514	413	367	485
	0%	1%	1%	1%	1%	2%	2%	3%	3%	3%	2%	2%	3%	4%	4%	4%	4%	5%	4%	3%	2%	3%

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Basic DCF model: The DDM

- Dividend Discount Model (*DDM):* Assume that the future is known with certainty and that perfect market assumptions apply.
  - no taxes and the term structure of discount rates is flat.

- Assume that the stock to be valued is purchased at price *P(0)* and held for one period and then sold, the dividend to be received in the next period is *Div(1)*) and the price received from selling the stock is *P(1)*

$$P(0) = \frac{Div(1) + P(1)}{1 + k} \quad \rightarrow \quad k = \frac{P(1) - P(0)}{P(0)} + \frac{Div(1)}{P(0)}$$

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Solving for the Infinite Horizon DDM

- Notice the essential role of a simplified firm with 'clean surplus' – no share repurchases, only dividends
- Accounting for randomness in the future cash flows by taking expectations conditional on information available at *t=0*, the discounted dividend model is derived by making a progressive substitution for prices:

$$E[P(1)] = \frac{E[P(2)] + E[Div(2)]}{1 + k} \rightarrow P(0) = \frac{E[Div(1)]}{(1 + k)} + \frac{E[P(2) + Div(2)]}{(1 + k)^2}$$

$$P(0) = \sum_{t=1}^{T} \frac{E[Div(t)]}{(1 + k)^t} + \frac{E[P(T)]}{(1 + k)^T} \rightarrow P(0) = \sum_{t=1}^{\infty} \frac{E[Div(t)]}{(1 + k)^t}$$

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Applying the *DDM:* Preferred Stock Valuation

- Preferred Stocks
  - Rationales for preferred stock issuance
    - Role of Basel III for banks
    - Debt surrogates for corporations
      - Low credits and non-bank financials
- Assume that *Div(t)* is fixed at *Div**
  - Apply the perpetual pricing model
    - $P(t) = Div^* / k$
  - Valuation for preferred shares involves comparison of the dividend yield (similar to traditional yield spread analysis)

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Preferred Share Features

- Fixed rate vs. Rate Reset
  - The reset rate can vary according to the length of time between reset dates and the reference rate used for the reset
    - See Enbridge Examples → see CIBC 'Canadian preferred shares' report in lecture 8 .zip file
    - www.prefinfo.com (Hymas Investments) has details of Cdn. Pref. shares
- Retractable vs. Redeemable
  - Redeemable preferred shares, also known as callable preferred shares, allows the issuer to buy back the (perpetual) preferred stock at a fixed (call) price
    - Terms and conditions depend on the prospectus
  - Retractable preferred shares are issued with a maturity date when the company can force the shareholders to redeem shares for a fixed payment
    - Terms and conditions depend on the prospectus, the retraction may be an exchange for common shares (not necessarily a cash price).

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The Gordon Growth Model

The ***Gordon growth model***

- assume the dividend changes over time according to the assumption: $D(t+1) = D(t)(1 + g)$, where g is the assumed constant growth rate in dividends.

$$P(0) = \sum_{t=1}^{\infty} \frac{Div(t)}{(1+k)^t} = \sum_{t=1}^{\infty} \frac{D(0)(1+g)^t}{(1+k)^t}$$

$$= \frac{D(0)(1+g)}{(1+k)} \left[1 + \frac{1+g}{1+k} + \frac{(1+g)^2}{(1+k)^2} + \frac{(1+g)^3}{(1+k)^3} + \ldots \right]$$

$$= \frac{D(0)(1+g)}{(1+k)} \left[\frac{1}{1 - \frac{1+g}{1+k}} \right] = \frac{D(1)}{k-g}$$

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Examples of Applying the Formula

- SAIS, p.428-33, examines examples from Damodaran (1994)
  - How is *k* estimated?
  - How is *g* estimated?
  - How is *D(1)* estimated?
  - What types of companies are examined?
- Exercise: use Gordon model to value BUD, GE and BCE

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Damodaran on Simplified DDM Valuation

Southwestern Bell has earnings per share of $4.33 in 1992 and paid out 63% of its earnings as dividends. Its earnings and dividends had grown at 6% a year between 1988 and 1992 and were expected to grow at the same rate in the long term. The beta for the stock was 0.95. The T-bond rate at the time of the analysis was 7% ...

Cost of equity = 7% + 0.95 x 5.5% = 12.23%

Value of equity = $2.73 x 1.06 / (0.1223 - 0.06) = $46.45

SW Bell was selling for $78.00 on the day of this analysis (May 1993).

Damodaran (1994, p.103) then uses the $78.00 stock price to solve for *g* in the Gordon model as 8.43%. This is interpreted as the expected growth rate embedded in the current price which is 2.43% higher than the estimated historical growth rate.

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Calculating the *g*, *k* and *Div*(1)

- To estimate *g* the dividend growth assumption is converted to earnings growth by assuming a constant dividend payout ratio (*b*)
  - *Div*(t) = *bE(t)* and *Div*(*t* +1) = *bE*(*t* + 1) → *E*(*t* + 1) = (1 + *g*) *E*(*t*)
    - Damodaran estimates the *g* from the previous 5 years

- To estimate *k* the *CAPM* is used with R_F as the long term bond rate, the estimated β and the geometric equity risk premium ($E[R_M] - R_F$) estimated from 1925 to 1992

- *Div*(1) is estimated from the observed *Div*(*0*)
  - *Div*(1) = *Div*(0) (1 + *g*)

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Two more Damodaran Examples: Exxon, Dresdner

Exxon has earnings per share of $3.82 in 1992 and paid out 74% of its earnings as dividends that year. The expected growth rate in earnings and dividends, in the long term, was expected to be 6%. The beta for Exxon was 0.75 and the T-Bond rate was 7% ... Cost of equity = 7% + 0.75 x 5.5% = 11.13% ... Value of equity per share = 2.83 x 1.06 / (0.1113 - 0.06) = $58.47. Exxon was selling for $65.00 on the day of this analysis (May 1993).

Bank. It is estimated that Dresdner "maintained a growth rate of 5% in earnings and dividends between 1983 and 1992, and was expected to grow at this rate in the long term". The analysis continues that Dresdner:

was also expected to have earnings per share of 34.05 DM in 1993 and to pay out 47.62% of its earnings as dividends. It had a beta of 0.87 in 1993, measured relative to the Frankfurt DAX. The ten-year bond rate in Germany at the end of July 1993 was 6.42% and the risk premium for stocks over bonds was assumed to be 3.5% ... Cost of equity = 6.42% + (0.87 x 3.5%) = 9.45%

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The Residual Income Model

- This model exploits the **clean surplus** relationship:
  - *BV(t) = BV(t-1) + E(t) - D(t)*
    - *D(t) = E(t) - ΔBV*
  - Clean surplus does not apply with share repurchases or other manipulations of the equity account
- The clean surplus equation is substituted into the general DCF model to obtain *(AE* is 'abnormal earnings', i.e., return on equity in excess of cost of capital)*:*

$$P(0) = \sum_{t=1}^{\infty} \frac{D(t)}{(1+k)^t} = \sum_{t=1}^{\infty} \frac{E(t) - \Delta BV(t)}{(1+k)^t}$$

$$= BV(0) + \sum_{t=1}^{\infty} \frac{(ROE(t) - k)\, BV(t-1)}{(1+k)^t} = BV(0) + \sum_{t=1}^{\infty} \frac{AE(t)}{(1+k)^t}$$

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Some Basic Residual Income Calculations

- $ROE(t) = E(t) / BV(t-1)$
  - *ROE* (return on equity) is an accrual measure
    - This is not a cash measure
- $k = \Delta BV / BV(t-1)$
  - This is an interpretation for *k* that differs from the *CAPM* interpretation of the Gordon *DDM*
- 'Return on equity in excess of cost of capital' interpretation of the residual income model needs to be in an accounting, not economic, sense

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The Return on Equity Approach

- Examine the numerator of the residual income model
  - *(ROE(t) – k) BV(t-1)*
    - *ROE is a key DCF variable*
- The *ROE* can be expressed in value driver format (Table 8.10, p.467):

$$ROE = \frac{Net\ Income}{Book\ Value\ of\ Equity}$$

$$= \left(\frac{Net\ Income}{Sales} \right) \left(\frac{Sales}{Total\ Assets} \right) \left(\frac{Total\ Assets}{Book\ Value\ of\ Equity} \right)$$

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P / BV, ROE and *P / E*

- Conventional measures of relative valuation are Price to Book Value (*P/BV*), Price to Earnings (*P/E*) and Return on Equity (*ROE*)
  - Given any two the other is given
- Assume Net Income and Earnings are the same:
  - $ROE = E / BV$
  - $P/E = (P / BV) \div (E / BV)$
    - This holds for aggregate and per share values

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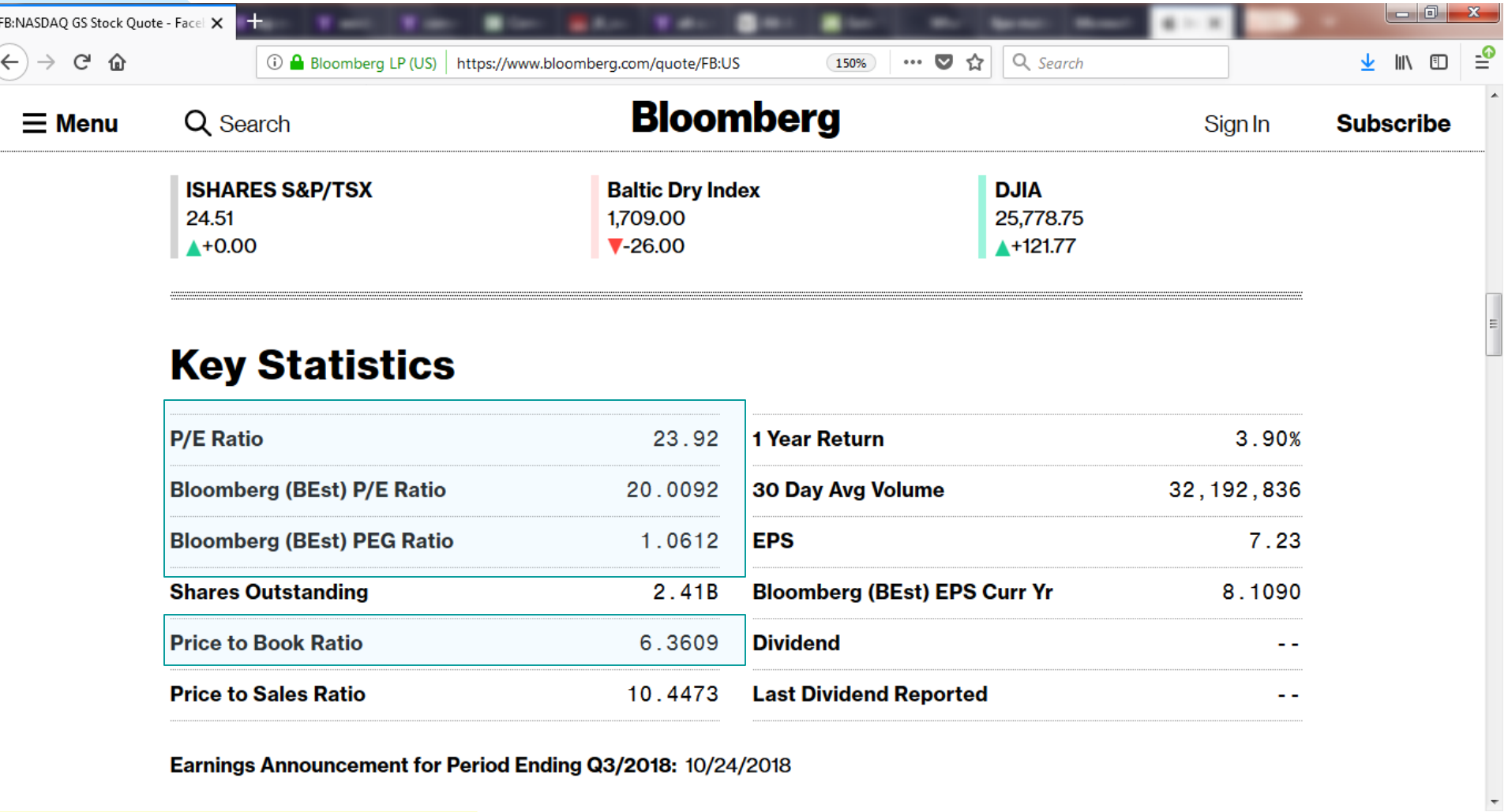
Key Statistics from Bloomberg for Facebook (24/8/18)



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Different Forms of the P/E Ratio

- The *P/E* ratio is a key valuation measure for practicing security analysts
- Letting *b* represent the dividend payout ratio (*Div(t) / E(t)*), i.e., *b E(t) = Div(t),* in the Gordon model the *P/E* ratio can be solved as:

$$P(0) = \frac{b\ E(1)}{k - g} = \frac{b\ E(0)(1 + g)}{k - g} \quad \rightarrow \quad \frac{P(0)}{E(0)} = \frac{b\ (1 + g)}{k - g}$$

- Observe what the *P/E* is when *g* = 0 (no growth) and *b* = 1 (full earnings payout to dividends)

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P/E Ratio for the AE Model

- The Residual Income Model can also be solved for a *P/E* ratio (after some manipulation)

- Recalling that the definition for *AE(t)* requires, *k BV(t-1) = E(t) - AE(t):*

$$\frac{P(0)}{E(0)} = \frac{1 + g}{k}\left\{1 + \left(\frac{AE(1)}{E(1)}\right)\left[\frac{g}{k - g}\right]\right\}$$

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The *PEG* Ratio

The ***"PEG" ratio***, or *P/E* to growth rate ratio:

- sometimes used as a crude rule of thumb to determine under/over valuation for a common stock.
  - For example, if the PEG ratio is less than one then the stock is undervalued because the 'cost of growth' as measured by the *P/E* is less than the actual growth.
  - Problems with the PEG → based on accrual # (earnings) and does not investigate sources of and future prospects for growth

In terms of the *AE* model:

$$\frac{P(0)}{100g\ E(0)} = \frac{PEG}{100} = \frac{1}{100}\left[\frac{1+g}{kg} + \frac{1+g}{k}\,\frac{AE(1)}{E(1)}\,\frac{1}{k-g}\right]$$

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S&P Indices
S&P 500 EARNINGS AND ESTIMATE REPORT
10/19/2010

Below is an initial look into the current reporting, the only sure item is that the numbers will change
(Lines 8-38 are new, comments are always appreciated - I have thick skin)

	DATA BASED ON COMPATIBLE DATA REPORTED TO DATE:			DATA BASED ON ALL 500 ISSUES:			
SECTOR	ISSUES USED	OPER MARGIN	AS RPT MARGIN	OP P/E ON 12 MONTH SEP,'10	OPER P/E ON 2010 EST	OPER P/E ON 2011 EST	S&P 500 YIELD
Consumer Discretionary	19	6.91%	6.39%	15.7	15.5	13.8	1.51%
Consumer Staples	10	6.55%	4.60%	15.3	15.2	13.8	3.06%
Energy	3	16.36%	16.36%	13.3	12.3	10.6	2.12%
Financials	14	10.81%	1.35%	15.3	12.8	10.8	1.14%
Health Care	7	13.44%	13.44%	12.8	12.4	11.0	2.21%
Industrials	9	7.69%	7.43%	16.2	15.7	14.0	2.22%
Information Technology	18	17.17%	16.87%	15.8	15.2	13.5	0.95%
Materials	2	0.00%	-1.23%	18.4	17.4	13.7	1.89%
Telecommunication Services	0	#DIV/0!	#DIV/0!	15.9	14.9	14.4	5.46%
Utilities	1	13.03%	13.03%	13.1	12.9	12.4	4.29%
S&P 500	**83**	**10.58%**	**7.78%**	**14.9**	**14.1**	**12.4**	**1.98%**
Estimate	500	8.64%	6.87%				

	S&P 600 2017 EST OPER P/E	S&P 600 5YR PROJ ANNUAL GROWTH %	S&P 600 PEG	MIDCAP 2017 EST OPER P/E	MIDCAP 5YR PROJ ANNUAL GROWTH %	MIDCAP PEG	SMALLCAP 2017 EST OPER P/E	S
Index	18.08	12.21	1.48	20.14	9.70	2.08	20.95	
Consumer Discretionary	19.74	17.92	1.10	16.44	12.21	1.35	17.73	
Consumer Staples	20.81	8.90	2.34	21.47	12.95	1.66	18.34	
Energy	29.27	24.50	1.19	-66.43	-34.92	1.90	-72.49	
Financials	14.11	9.18	1.54	16.44	10.46	1.57	16.95	
Health Care	16.12	10.62	1.52	19.28	13.27	1.45	29.58	
Industrials	18.43	10.01	1.84	19.33	12.48	1.55	19.40	
Information Technology	18.01	13.45	1.34	19.55	12.72	1.54	19.77	
Materials	18.42	11.43	1.61	17.64	9.59	1.84	19.40	
Real Estate	38.78	8.21	4.73	33.20	5.27	6.30	34.20	
Telecommunication Services	13.70	4.13	3.32	-22.56	-0.22	101.24	38.67	
Utilities	18.59	5.16	3.61	20.72	5.82	3.56	21.52	

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Free Cash Flow to Equity Model

- The free cash flow to equity model (*FCFE*) aims to measure the return to equity above the amount required to: maintain existing production levels; or, alternatively, to keep the firm on a particular growth path.
  - Adjustments for payment to debt can create conceptual problems
  - As with PEG, *FCFE* is an accrual number; Difficult to estimate future values of *FCFE*
- Much the same manipulations as for the models using dividends can be applied to this model (see sec. 8.3):

$$P(0) = \sum_{t=1}^{\infty} \frac{FCFE^*(t)}{(1 + k)^t}$$

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Financial Statement Analysis

- Recall from Lecture 7 the observation of GDC:
  - "All security analysis involves the analysis of financial statements"

- Under US ***GAAP***, the accounting statements that are available for analysis are:
  - the ***balance sheet*** (Tables 8.3 and 8.4)
  - the ***income (earnings) statement*** (Tables 8.1 and 8.2)
  - the ***cash flow statement*** (Table 8.5 and 8.6)
  - the ***statement of stockholders' equity***.

- In addition to these statements, there is also the management discussion and analysis, risk factors, notes to financial statements and other supplementary information.

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Financial Statement Analysis and the Presentation

- The ‘Description of the Presentations Model’ on the class webpage has discussion of how to use the Balance Sheet, Income Statement and, especially, the Cash Flow Statement (other Financial statements) in the valuation of common stocks
- The financial statements provide essential information about whether the ‘story’ of a company has validity → the ‘story’ is constructed from various qualitative and quantitative sources
- The regulatory files, especially the Annual Report / 10-K, are essential sources of information

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Accruals, Cash Flows and Financial Statements

- **The Financial Statements are an inter-connected picture of the company, all three statements need to be considered → the BALANCE SHEET AND EARNINGS STATEMENT HAVE MANY IMPORTANT ACCURAL ITEMS THAT CAN DISTORT THE ACCURACY OF THE INFORMATION CONTAINED IN THE FINANCIAL STATEMENTS**

- **There is an OVER-EMPHASIS in the financial press on EARNINGS which has many ACCRUALS (e.g., Depreciation) → essential to consult the CASH FLOW STATEMENT to provide an accurate assessment of the impact of accruals on the other financial statements**

- **The NOTES to the financial statements need to be investigated when there are large items that impact a financial statement**

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Some Examples: Toll Bros. + Methanex

- On class webpage see MX-TOL_12-3.zip files
  - Others .zip files have information for earlier selected years
- **TOLL Bros.** Is a luxury home builder in the US (www.tollbros.com)
  - Home builders were a central feature of the US housing market collapse/financial crisis in 2008-9
  - In the 26 year .pdf in 2012 file examine the acceleration and collapse of various important numbers → examine the cash flow statement in 2005-6 .zip file to identify the impact of the inventory accrual
- **Methanex** (locally headquartered) is the world's largest producer and supplier of methanol (www.methanex.com)
  - Annual report is in the 11-10 .zip file
  - Examine the impact on Methanex of changes in the price of methanol (obtainable for company webpage) and commissioning / decommissioning of plants around the world
  - The 2012 file illustrates how quarterly earnings announcements are made in Canada vs. 10-Q release in US.

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Relevance of the Cash Flow Statement

- The ***cash flow statement*** is based on the following identity:
  - *Change in Cash = Cash from Operations + Cash from Investing Activities + Cash from Financing Activities*
- Though it might seem that the change in cash is only an incidental item for most valuations, it is the process of arriving at the change that is important. By collecting items according to function, the activities of the firm reflected in the other accounting statements becomes more transparent.
- The cash flow statement has essential information about how the cash generated by operations is distributed to shareholders as **dividends, share buybacks**, investment in securities, capital expenditures ETC.

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Earnings, Free Cash Flow and EVA

- ***What is the appropriate 'cash flow' to discount in the DCF model?***
  - '***economic free cash flow***' (Buffett)
  - ***net cash flow***
  - ***free cash flow***
  - ***EVA***

- Higgins (1998, p.19) observes:
  - "So many conflicting definitions of cash flow exist today that the term has almost lost meaning"

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Free Cash Flow (*FCF*), A Non-GAAP measure

- Various methods are suggested for *FCF*
  - Free Cash Flow to the Firm (*FCFF*)
  - Free Cash Flow to Equity (*FCFE*)
  - Could be calculated from Income Statement or Cash Flow Statement
- Basic Idea is to provide a measure of Economic 'Profit'
- 'Simple *FCFF*', determined from the Cash Flow Statement: *FCFF = CFO – Cap. Ex.*
- 'Adjusted Simple *FCFF': Simple FCFF – Div.*

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Inter Pipeline, Annual Report 2017

Consolidated Statements of Cash Flows

(millions of Canadian dollars)	Years Ended December 31 2017	2016
OPERATING ACTIVITIES		
Net income	$ 526.7	$ 477.6
Items not involving cash:		
Depreciation and amortization	255.7	229.7
Loss on disposal of assets	9.5	6.5
Non-cash expense	4.1	20.0
Deferred income tax expense	188.3	100.4
Proceeds from long-term deferred revenue	6.3	-
Proceeds from long-term lease inducements	-	14.6
Funds from operations	990.6	848.8
Net change in non-cash operating working capital (note 21)	37.8	(42.9)
Cash provided by operating activities	1,028.4	805.9
INVESTING ACTIVITIES		
Expenditures on property, plant and equipment	(378.8)	(186.1)
Proceeds on disposal of assets	0.3	1.1
Acquisition of offgas processing (note 24)	-	(1,383.0)
Assumption of cash on acquisition of offgas processing (note 24)	-	46.9
Acquisition of Cold Lake non-controlling interest (note 25)	-	(355.1)
Net change in non-cash investing working capital (note 21)	29.0	7.0
Cash used in investing activities	(349.5)	(1,869.2)
FINANCING ACTIVITIES		
Cash dividends paid to shareholders of Inter Pipeline Ltd. (note 8)	(302.5)	(470.4)
Cash distributions paid by Cold Lake to non-controlling interest	-	(31.7)
Cash contributions received from Cold Lake non-controlling interest	-	0.6
(Decrease) increase in debt	(371.6)	979.2

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Other Suggestions for *FCF*

- *FCFF = EBIT(1 - Tax rate) + Depreciation - Capital Expenditures ± Δ Net Working Capital*
  - *Mix of Income Statement and Cash Flow Statement*
- *FCFE = Net Income + Depreciation - Capital expenditures - Δ Net Working Capital - Debt principal repayments + Proceeds of New Debt Issues*
  - Calculations from Cash Flow Statement
- *Note the potentially important impact of adjustments to Debt on FCFE*

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What is a Value Driver?

- A ***value driver*** is a factor that has a significant impact on the level and change of the security value.
  - Value drivers are essential items that need to be identified in constructing the ‘story’ about a company, e.g., Apple and iPhone demand
- Two key dimensions to value drivers:
  - profitability
  - growth

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Cases: The COS Syncrude Purchase

- Canadian Oil Sands (COS.UN) is a ***unit trust*** with ownership in Syncrude as the sole income producing asset.
- The oil sands projects involve surface mining of oil with an alternative technology
- In Feb. 2003 COS announced the intention to buy 10% of Syncrude from Encana
  - Problem is to assess whether fair value was paid for the purchase

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Cases: *Anheuser-Busch* (BUD)

- GDC (p.437) observe: “in practice, we find that the more a company’s results are subject to fluctuation, the less predictable becomes the future average. Thus the best industries for valuation are those which do not show large profit declines in periods of recession.”
  - Beer industry provides an excellent of a company with stable cash flows
  - Not all brewers have this characteristic
- The key element in any security valuation is the price.

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Cases: Delta Airlines (DAL)

- Airlines are a favorite example used by Buffett to describe ‘growth without profits’
- Valuation of major US airlines after 9/11 are an excellent example of companies on the fast track to bankruptcy
- Delta was the strongest of the hub-airline majors.
  - Need to assess the competition with Southwest in conjunction with the 9/11 shock

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